Islamic University of Gaza
Water Resources Management
EENV3352
Second Semester (2011-2012)
Allowable time 70 minutes

Instructors:
Dr. Yunes Mogheir
Eng. Ahmed Alsahhar.

CLOSED BOOK EXAM

Student Name: محمد تيسير موسى   Student No.: 120081860

Q1	3	5
Q2	10	10
Q3	8	8
Q4	6	7
Total	27	30

Question 1 (5 Marks)

1) The property of a geological formation which represents its water storage capacity, is:

a) Permeability b) Porosity
c) Both (a) and (b) d) None of these

2) The geological formation, which may contain water, but does not yeild any, is an:

a) aquifer b) aquifuse c) aquiclude d) aquitard

3) The zone of aeration in a ground profile consists of :

a) capillary finge b) soil water zone c) intermediate zone d) all of them

4) specific retention of groundwater is larger in:

a) coarse grained soils b) fine grained soils
c) medium grained soils d) Dune sand soils

5) Areas with wide contour spacings have ....with compare to those of narrow spacings.

a) lower hydraulic conductivities b) equal hydraulic conductivities
c) higher hydraulic conductivities d) none of these

Question 2

(10 Marks)

In the table below, results of a sieving analysis are tabulated. Using these data to:

1. **Prepare a grain size distribution curve for this sample?**
2. **Assess whether the sample is well graded or poorly graded?**
3. **What would be the reasonable porosity values for this sample?**

Passing Fines = (total mass retained) − (cumulative m.r.)

Passing (%) = Passing fine / total mass ret

Grain Size (mm)	Mass retained (g)	Cumulative Mass retained (g)	Passing Fine	Passing (%)
4.75	11.92	11.92	438.08	97.35
2.360	2.66	14.58	435.42	96.76
1.180	37.30	51.88	398.12	88.47
0.840	87.53	139.41	310.59	69.02
0.710	78.07	217.48	232.52	51.67
0.600	72.95	290.43	159.57	35.46
0.425	98.82	389.25	60.75	13.5
0.150	50.85	440.1	9.9	2.2
0.075	8.10	448.2	1.8	0.4
< 0.075	1.80	450.00	0	0
Total weight	450.00			

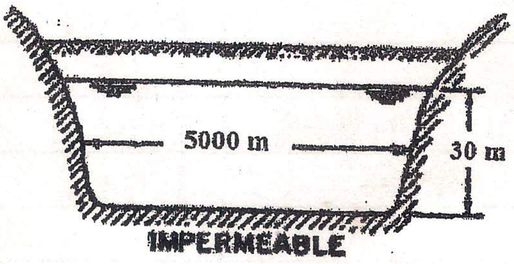


0.062 — 0.075

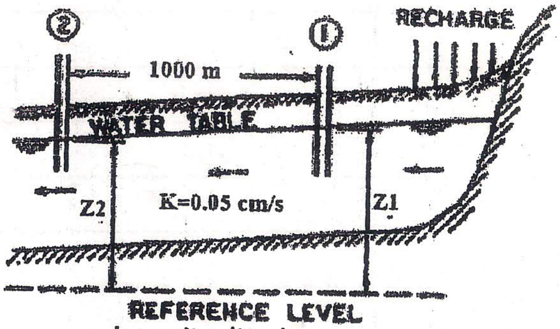
0.125

Question 3 : **(8 Marks)** 8

Consider the unconfined aquifer consisting of sand/gravel layers given in the following diagram where the piezometric height difference between the two monitoring wells is 0.7 m. The porosity of the aquifer material is 20%.



Transverse cross section



Longitudinal cross section

A = 30 * 5000 = 150000 m²

K = (0.05/100) * 60 * 60 * 24 = 43.2 m/d

(1) Compute the volumetric flow rate (m^3/d) through the system?

Δh = 0.7 L = 1000

Q = KAi
= 43.2 * 150000 * $\frac{0.7}{1000}$
= 4536 m³/d ✓

(2) Compute the average travel time (years) of water from the head of the valley to a distance 5 km downstream?

t = $\frac{L}{V_a}$ L = 5000 m

$V_a = \frac{Ki}{\alpha} = \frac{43.2 * (\frac{0.7}{1000})}{0.2}$ = 0.1512 m/d

t = $\frac{5000}{0.1512}$ = 33068.783 day

⇒ 90.599 years ✓

(2) ⇒ $U_c = \frac{d_{60}}{d_{10}} = \frac{0.75}{0.38} = 1.97 < 6$ it is poorly graded

$U_c > 6$ wellgraded

$U_c < 6$ poorlygraded

(3) ⇒

$$\alpha = \frac{3*43 + 2*43 + 8*39 + 70*39 + 13*39 + 2*34 + 2.35*34}{100}$$

$$\alpha = 39.119$$